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EXAMINER

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Paper No. 15

Application Number: 09/881,361
Filing Date: June 13, 2001
Appellant(s): HOFFMAN ET AL.

Mr. James R. Brueggemann
For Appellant

SUPPLEMENTAL EXAMINER'S ANSWER

MAILED
MAR 31 2004
GROUP 3700

This is in response to the appeal brief filed 11 April 2003.

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Pursuant to the Remand under 37 CFR 1.193(b)(1) by the Board of Patent Appeals and Interferences on 19 February 2004, a supplemental Examiner's Answer is set forth below:

1. A translation into English of Japanese Patent Document 9-248355 has been completed and is appendix 1 to this Supplemental Examiner's Answer.

2. Reevaluation of the various rejections of claims 1 through 19 have been done in light of the translation. As a result the rejections are being maintained. The explanation of the rejections with reference to the translation is below. The only changes to the rejection were the location of the disclosed teachings in the complete English translation of appendix 1. These teachings were previously used in the Examiner's Answer dated 20 May 2003 using the previously cited English abstract.

(10) *Grounds of Rejection*

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3-4, 6, 8-9, 11, and 15 stand rejected and claims 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 9-248355 in view of Kochevar (4,220,336) and WO 00/62873.

JP 9-248355 discloses a hosel plug being cylindrical in the form of fitting in a hole which has a diameter (0007), a shaft secured to the hosel cavity at a location above the hosel plug (Fig. 1), a plurality of plugs each having the same size and shape but different weights, and plug weights in the range of (.5-3) grams (0007).

JP 9-248355 lacks a plug having a metallic powder, a compliant polymeric material compression fitted into the hosel cavity by slight compression without a need of deforming a plug from its substantial shape, and different plug weights based on the amount of powder mixed into the plug material. Kochevar discloses a weight slug placed inside a shaft formed of a polymeric material in the form of polyisobutylene which is compliant in that it can be compressively loaded (abstract, Col. 2, Lns. 59-67) and is deformable (Col. 5, Lns. 44-50) without a need to deform a plug from a substantial shape (Figs. 2, 6-9), a powdered metal (Col. 5, Lns. 36-50), and varying the proportions of the materials to achieve desired results (Col. 5, Lns. 67 through Col. 6, Ln. 2). WO 00/62873 discloses a deformable insert being placed inside a shaft being a polymer material (Page 8 Lns. 14-15) and compression fitting into a shaft (Page 12 Lns. 9-11) by slight compression without a need of deforming a plug from its

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substantial shape (Figs. 2, 3A, and 5A). In view of the patent of Kochevar it would have been obvious to modify the club of JP 9-248355 to have a plug being a deformable binder with a metal powder in order to simplify the assembly process by deforming the shape to fit a cavity instead of requiring more precise dimensions to ensure proper fitting. In addition, in view of the patent of Kochevar it would have been obvious to modify the club of JP 9-248355 to have different plug weights based on the amount of powder mixed into the plug material in order to provide a variety of weights from which a golfer would choose from to adjust a clubs swing weight. In view of the document WO 00/62873 it would have been obvious to modify the club of JP 9-248355 to have a binder being a compliant polymeric material compression fitted into the hosel cavity by slight compression without a need of deforming a plug from its substantial shape in order to have a plug which returns to the original form when a stress is removed so that the plug is more easily handled and stored without deteriorating, in order to have a clean method of fixing a plug to a cavity without the use of an adhesive, and in order to be able to temporarily fix a plug to a cavity.

3. Claims 2 and 13-14 stand rejected under 35 U.S.C. 103(a) as being unpatentable over JP 9-248355 in view of Kochevar (4,220,336) and WO 00/62873 as applied to claims 1, 3-4, 6, 8-9, 11, 15 and 17-18 above, and further in view of Yoneyama and Sasamoto.

JP 9-248355 lacks a metallic powder being tungsten, a polymeric material being nylon, and tungsten having a weight percentage in the range of 0-96 %. Kochevar discloses a metal lead metal powder added to a plug with a weight percentage of 90 % (Col. 5, Lns. 60-65).

Yoneyama discloses a metallic powder added to a head weighting member being lead or

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tungsten (Col. 3, Lns. 28-40). In view of the patent of Kochevar and Yoneyama it would have been obvious to modify the plug of JP 9-248355 to have a metallic powder being tungsten in a weight percentage of 90 % and varied from that amount to achieve different weighted plugs in order to add more weight for the same volume of powder added to a plug compared to lead. Sasamoto discloses a weighting member being made of a binder and metal powder with the binder being nylon (Col. 3, Lns. 58-68). In view of the patent of Sasamoto it would have been obvious to modify the club of JP 9-248355 to have a polymeric material being nylon in order to utilize a polymeric material available in the market place and to utilize the characteristics of nylon.

4. Claims 5 and 12 stand rejected under 35 U.S.C. 103(a) as being unpatentable over JP 9-248355 in view of Kochevar (4,220,336) and WO 00/62873 as applied to claims 1, 3-4, 6, 8-9, 11, 15, and 17-18 above, and further in view of Bingman.

JP 9-248355 lacks a hosel's lower cylindrical cavity having a diameter of about 8.5 mm and a length of 10 mm, a hosel's upper cylindrical cavity having a diameter of about 9 mm and a length of 25 mm. Bingman discloses a cylindrical cavity (32) for a shaft being 9 mm (Col. 4, Lns. 53-58) and an axial length of an upper section (36) of a cylindrical cavity being 10 millimeters (Col. 4, Lns. 49-54) with an additional hosel depth below the upper section (Ref. No. 32, Fig. 3). Clearly with that addition of the lower hosel bore (32) the total hosel length would be over 20 mm. An artisan skilled in the art of designing a hosel enough surface area to form a secure attachment to a shaft would have selected a suitable length bore for a hosel in which 25 millimeters is included. In addition, an artisan skilled in the art of forming a lower

hole for a weight plug smaller in diameter than a hosel hole which fits a shaft would have selected a suitable diameter and depth of a hole to prevent the shaft from entering and to add sufficient weight in which a hole of 8.5 mm in diameter and 10 mm in depth is included.

In view of the patent of Bingman it would have been obvious to modify the club of JP 9-248355 to have a hosel's upper cylindrical cavity having a diameter of about 9 mm in order to fit a shaft having a tip diameter of 9 mm. In addition, it would have been obvious to modify the club of JP 9-248355 to have a cavity length of 25 mm in order to have sufficient surface area to attach a tip end of a shaft to a head.

It would have been obvious to modify the club of JP 9-248355 to have a hosel's lower cylindrical cavity having a diameter of about 8.5 mm in order to prevent a shaft having a diameter of 9 mm from placing stress on a plug and to have a cavity length of 10 mm in order to have sufficient volume to add a sufficient amount of weight to a club to affect the swing weight.

5. Claims 7 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 9-248355 in view of Kochevar (4,220,336) and WO 00/62873 as applied to claims 1, 3-4, 6, 8-9, 11, 15, and 17-18 above, and further in view of Allen.

JP 9-248355 discloses a plug having a weight of .5-3.0 grams (0007).

JP 9-248355 lacks a plug constituting (.25 -3.25) % of the heads total weight. Allen discloses a head total weight being in a range of 190-205 grams. In view of the patent of Allen it would have been obvious to modify the club of JP 9-248355 to have a total head weight of

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190- 205 grams in order to transfer energy to a ball at impact. As such the plug would constitute (.25 -3.25) % of the heads total weight.

6. Claim 16 stands rejected and claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 9-248355 in view of Kochevar (4,220,336), WO 00/62873, Yoneyama, Sasamoto and Allen.

See paragraphs above for elements of structure previously rejected by JP 9-248355 in view of Kochevar, WO 00/62873, Yoneyama, Sasamoto and Allen.

Response to Arguments

7. The argument that it is improper to combine the references of JB '355, Kochevar, and WO '873 due to there being no motivation is disagreed with. JB '355, Kochevar, and WO '873 all disclose teaching of adding plugs to a lower part of a golf club. Clearly the teachings of each of them can be used to attaching plugs to a cavity in a hosel. The argument that it is improper to use the reference of WO '873 since WO '873 does not disclose a polymer with metallic powder to weight a club is disagreed with. Kochevar was used to show the teaching of adding metallic powder to a binder to weight a club. WO '873 was used to show a suitable binder which is used for plugs attached to a lower end of a club. The argument that it is improper to use the reference of Kochevar since Kochevar discloses a putty-like consistency is disagreed with. Kochevar was used to only show that it is known to add metallic powder to weight plugs. JB '355, Kochevar, and WO '873 all show the three different material forms of

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plugs which are non-deformable solid, viscous (putty-like) and a deformable material which returns to its shape (non-viscous). Kochevar and JB '355 disclose different ways to weight plugs. Kochevar and WO '873 show different binders. The argument that it is improper to combine the references of WO '873 and Kochevar since it would cause it to lose its putty like consistency is disagreed with. Kochevar and WO '873 were used to show different binders. The deformable non-putty-like binder of WO '873 is a suitable substitute of the deformable binder of Kochevar. The Non-viscous material of WO '873 is non-viscous as is the material of JB '355. The argument that it is improper to use the reference of Billings since Billings did not disclose adding a weight within a bore is disagreed with. Billings was not used for this but to show a known hosel bore diameter and hosel bore depth. JB '355 was used to show the teaching of adding weight within a bore. The same response is applied to the argument towards Allen. Allen was not used to show the teaching of adding a weight within a bore but JB '355 was used to show this teaching.

(11) Response to Argument

Applicant argues:

1. It is improper to combine to references of JP '355 in view of Kochevar and WO '873 because the examiner failed to show motivation of one to make a plug comprising a mixture of powdered metal and a compliant polymeric material without the benefit of the present invention.

2. It is improper to modify the reference of Kochevar to have the plug with a binder being a compliant polymeric material since adding this type of binder would lose the putty-like consistency taught by Kochevar.

3. It is improper to use the reference of WO '873 since WO '873 does not suggest a polymeric material as a binder to suspend another material as a metallic powder.

4. It is improper to use the references of Yoneyama and Sasamoto since they fail to address a hosel plug comprised of a mixture of a metallic powder and a compliant polymeric material secured in place by compression of the compliant polymeric material.

5. It is improper to use the reference of Bingman since Bingman fails to address a hosel plug comprised of a mixture of a metallic powder and a compliant polymeric material secured in place by compression of the compliant polymeric material.

6. It is improper to use the reference of Allen since Allen fails to address the shortcomings of JP '355, Kochevar and WO '873.

7. It is improper to combine the six references of JP '355, Kochevar, WO '873, Yoneyama, Sasamoto, Bingman and Allen since there is no motivation to arrive at a club as claimed in claim 1 or claim 16.

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8. It is improper to rely on WO '873 and Kochevar for such a limited purpose.

Examiner's response:

9. With respect to items 1, the argument that it is improper to combine to references of JP '355 in view of Kochevar and WO '873 because the examiner failed to show motivation of one to make a plug comprising a mixture of powdered metal and a compliant polymeric material without the benefit of the present invention is disagree with. Kochevar discloses a powdered metal in the form of lead (Col. 5, Lns. 60-65) and a binder containing a polymeric material in the form of polyisobutylene (Col. 5, Lns. 60-65) which is compliant in that it can be compressively loaded (abstract, Col. 2, Lns. 59-67) and is deformable (Col. 5, Lns. 44-50) without a need to deform a plug from a substantial shape (Figs. 2, 6-9). The reference of WO '873 also showed a polymeric material used as an insert and even containing a weight. This reference of WO '873 is an accumulative reference of what is known in the art and has been kept in the rejection for completeness though it was not really needed.

10. With respect to item 2, the argument that it is improper to modify the reference of Kochevar to have the plug with a binder being a compliant polymeric material since adding this type of binder would lose the putty-like consistency taught by Kochevar is disagreed with. Kochevar had a compliant polymeric material as a binder in the form of polyisobutylene (Col. 5, Lns. 60-65) and it has a putty-like consistency (abstract).

11. With respect to item 3, the argument that it is improper to use the reference of WO '873 since WO '873 does not suggest a polymeric material as a binder to suspend another material as a metallic powder is disagreed with. WO '873 discloses a polymeric material suspending a solid metal core (Page 4, Lns. 21-32). Kochevar discloses a binder being a polymeric material suspending a metallic powder. WO '873 is an accumulative reference of what is known in the art and has been kept in the rejection for completeness though it was not really needed.

12. With respect to item 4, the argument that it is improper to use the references of Yoneyama and Sasamoto since they fail to address a hosel plug comprised of a mixture of a metallic powder and a compliant polymeric material secured in place by compression of the compliant polymeric material is disagreed with. Yoneyama and Sasamoto were not used to show this feature but Kochevar and WO '873 were. However WO '873 was not really needed. Kochevar discloses a powdered metal in the form of lead (Col. 5, Lns. 60-65) and a binder containing a polymeric material in the form of polyisobutylene (Col. 5, Lns. 60-65) which is compliant in that it can be compressively loaded (abstract, Col. 2, Lns. 59-67) and is deformable (Col. 5, Lns. 44-50) without a need to deform a plug from a substantial shape (Figs. 2, 6-9). Clearly it would have been an obvious and suitable selection for a plug for the head of JP '355. Yoneyama was used to show that it is known to replace tungsten powder with lead powder for a golf head piece. Sasamoto was used to show another type of mixture of a polymeric material in the form of nylon and metal powders used in golf head pieces.

13. With respect to item 5, the argument that it is improper to use the reference of Bingman since Bingman fails to address a hosel plug comprised of a mixture of a metallic powder and a compliant polymeric material secured in place by compression of the compliant polymeric material is disagreed with. See paragraph 9 above.

14. With respect to item 6, the argument that it is improper to use the reference of Allen since Allen fails to address the short comings of JP '355, Kochevar and WO '873 is disagreed with. See paragraph 9 above.

15. With respect to item 7, the argument that it is improper to combine the six references of JP '355, Kochevar, WO '873, Yoneyama, Sasamoto, Bingman and Allen since there is no motivation to arrive at a club as claimed in claim 1 or claim 16 is disagreed with. With respect to claim 1 see paragraph 9 above. With respect to claim 16, the number of references are not important as long as there is motivation to make the modification. The examiner provided motivation to make the modifications in each instance a reference was used.

16. With respect to item 8, the argument that it is improper to rely on WO '873 and Kochevar for such a limited purpose is disagreed with. See paragraph 9 above.

17. Kochevar, WO '873 and Sasamoto all disclose that it is known to use a polymeric material containing a weight to add weight to a specific location on a golf club. The polymeric

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material and weight as defined in the claims have all been used in the art and as such are suitable selections when weighting golf clubs.

18. After translating into English of Japanese Patent Document 9-248355 it is discovered that this document teaches using tungsten powder or other like forms as an alternative to solid plugs in weighting clubs using a hosel cavity (0010). It is believed that this teaching even more supplies motivation of using other suitable forms of weights to make the modification that were made to Japanese Patent Document 9-248355.

For the above reasons, it is believed that the rejections should be sustained.

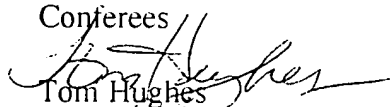
Respectfully submitted,


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March 24, 2004

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Appendix 1

PTO: 2004-2377

Japanese Published Unexamined (Kokai) Patent Publication No. H9-248355; Publication Date: September 22, 1997; Application No. H8-87708; Application Date: March 15, 1996; Int. Cl.⁶: A63B 53/06 53/02; Inventor: Hirato Shimazaki; Applicant: Bridgestone Sports Corporation; Japanese Title: Gorufu Kurabu (Golf Club)

[Title of Invention]
Golf Club

[Abstract]
[Problem]

To allow everybody to easily adjust the swing balance at high precision without deteriorating the performance and the quality of a golf club.

[Measures to Solve the Problem]

As in a golf club wherein a hosel part 2 is provided in a head body 1 and wherein a shaft 4 is inserted into an inserting hole 3 of hosel part 2, a lower hole 10 is formed, which is extended to a sole A1 side of head body 1 apparently on an extended line of inserting hole 3 of hosel part 2. A balance adjusting weight 11 is provided inside lower hole 10.

[Claim(s)]
[Claim 1]

A golf club wherein a hosel part is provided in a head body and wherein a shaft is inserted into an inserting hole of the hosel part, characterized in that a lower hole is formed, which is extended to a sole side of the head body apparently on an extended line of the inserting hole of the hosel part; and a balance adjusting weight is provided inside the lower hole.

[Claim 2]

The golf club, as disclosed in Claim 1, characterized in that the lower hole is opened on the sole side and formed in a location distant from the inserting hole.

[Claim 3]

The golf club, as disclosed in Claim 2, characterized in that the inserting hole and the lower hole are continuously provided.

[Detailed Description of the Invention]
[0001]

[Field of Industrial Application]

This invention pertains to a golf club. In particular, the invention relates to a golf club that makes the adjustment of the swing balance easier.

[0002]
[Prior Art]

The adjustment of the swing balance for prior art golf club is made as described below. As shown in Fig.7, an adhesive is poured into inserting hole 3 of hosel part 2. Shaft 4 is then inserted into inserting hole 3 to adhere the components. Before the adhesive that has entered a hollow part on the tip of shaft 4 is dried, a lead weight 5 at a predetermined weight is inserted into the hollow part of shaft 4 from a grip attaching side of shaft 4, thereafter sinking the weight into the adhesive to fix the golf club. Or after shaft 4 has been completely attached as described above, more specifically after the adhesive has been dried, a powder body such as tungsten is inserted into the hollow part from the grip attaching side of shaft 4, thereafter squeezing a cork stopper into the hollow part to fix the golf club.

[0003]

[Problem of Prior Art to Be Addressed]

When the balance is adjusted by using this method, the weight moves inside the shaft due to an insufficient fixing thereof, depending on the dry state of the adhesive that adheres the head with the shaft or the inserting state of the cork stopper, so as to sometimes deteriorate the performance and the quality of the club. As the drying speed of the adhesive sometimes varies by the environments including the season and the weather, the operation requires training in terms of speed and sense. Other than these problems, since the insert including the weight is applied to the tip of the hole of the pipe-shaped shaft on the head side, if it reaches the upper part of the adhering part of the shaft with the head from the root, the shaft is easily bent at the root thereof or changes the warping level depending on the insert weight to occasionally deteriorate the performance and the quality of the club. The diameter of the shaft hole varies by the shaft in many cases. Even if inserts at an equivalent weight are used, a difference sometimes occurs between the inserts if they reach the upper part from the root of the shaft or not. As mentioned above, there are many points that need to be paid attention during the adjustment, and defectives easily occur.

[0004]

The purpose of the invention is to eliminate the disadvantages associated with prior art golf clubs and to offer a golf club that allows everybody to easily adjust the swing balance at high precision without deteriorating the performance and the quality of the club.

[0005]

[Measures to Solve the Problem]

In order to achieve the purpose, the invention is a golf club wherein a hosel part is provided in a head body and wherein a shaft is inserted into an inserting hole of the hosel part, characterized in that a lower hole is formed, which is extended to a sole side of the head body apparently on an extended line of the inserting hole of the hosel part; and a balance adjusting weight is provided inside the lower hole.

[0006]

[Embodiment]

Preferred embodiments of the invention are described hereinbelow with reference to the drawings.

[0007]

As in a first embodiment as shown in Fig.1, hosel part 2 is provided on head body 1, and shaft 4 is inserted in inserting hole 3 of hosel part 2. Lower hole 10 extended to the sole 1A side of head body 1 is formed apparently on an extended line of inserting hole 3 of hosel part 2. Balance adjusting weight 11 is then provided inside lower hole 10. In the embodiment, inserting hole 3 and lower hole 10 are continuously provided, and the diameter of lower hole 10 is made slightly smaller than that of inserting hole 3. The diameters of inserting hole 3 and lower hole 10 can also be equivalent without any problem. Fig.2 illustrates weight 11 and shaft 4 attached to each other. Reference number 12 refers to a socket. An adhesive is poured in inserting hole 3 and lower hole 10 in advance as similar to as in prior art golf clubs. Both weight 11 and the tip of shaft 4 are adhered in the respective holes with the adhesive. The following four types of weights at the following weights are prepared: a plastic weight at 0.5 g; an aluminum alloy weight at 1.0 g; a stainless weight at 2.0 g; and a lead weight at 3.0 g. These weights are formed as cylinders of an equivalent volume and shape and selected according to the swing balance to be adjusted. ✓

[0008]

As in a second embodiment as shown in Fig.3, lower hole 10 is opened on the sole 1A side, which is a location distant from inserting hole 3. Fig.4 illustrates shaft 4 and weight 11 accommodated in the respective holes of Fig.3. In the second embodiment, even after shaft 4 has been completely fixed to hosel 2 applying an adhesive, more specifically after the adhesive has been dried, the swing balance is adjustable. Shaft 4 and weight 11 can also be adhered to each other at the same time.

[0009]

A third embodiment as shown in Fig.5 illustrates inserting hole 3 and lower hole 10 continuously provided wherein lower hole 10 is opened on a sole 1A side. Fig.6 illustrates shaft 4 and weight 11 attached to each other as in the embodiment of Fig.5. As for lower hole 10 opened on the sole 1A side, the gap on the sole 1A side can be filled with a proper substance in advance to effectively prevent a clogging of foreign objects including mud and the like. This applies to the embodiment of Fig.4 as well.

[0010]

Weights 11 can be formed using an equivalent material alone or various materials by a combination when they are fixed. The following materials at the following specific gravities are also utilized other than the aforementioned materials: copper (8.93 specific gravity); iron (7.64 specific gravity); zinc (7.14 specific gravity); and titanium (4.5 specific gravity). Weights 11 are not limited in the solid form, but they can also be in a powder form such as a tungsten powder or the like. ✓

[0011]

[Advantageous Result of the Invention]

As described above, according to the invention, the lower hole is formed, which is extended to the sole side of the head body apparently on the extended line of the inserting hole of the hosel part, and the balance adjusting weight is provided inside the lower hole. Due to this structure, the weight will not present inside the hollow part of the shaft. The performance of the shaft will not change. The weight for adjusting the swing balance can also easily be accommodated without requiring any training.

[Brief Description of the Invention]

[Fig. 1]

Fig. 1 is a cross-sectional view illustrating a first embodiment.

[Fig. 2]

Fig. 2 is a front view illustrating the first embodiment after the assembly.

[Fig. 3]

Fig. 3 is a cross-sectional view illustrating a second embodiment.

[Fig. 4]

Fig. 4 is a front view illustrating the second embodiment after the assembly.

[Fig. 5]

Fig. 5 is a cross-sectional view illustrating a third embodiment.

[Fig. 6]

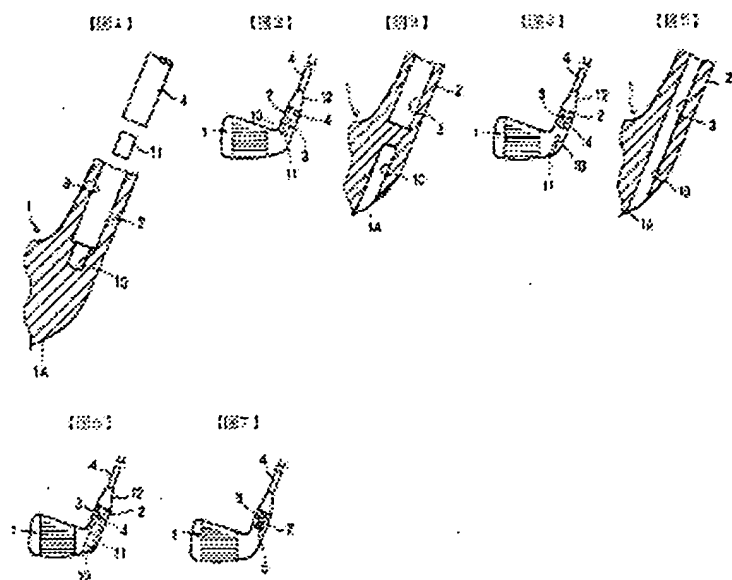
Fig. 6 is a front view illustrating the third embodiment after the assembly.

[Fig. 7]

Fig. 7 is a front view illustrating an example of prior art golf club.

[Description of the Reference Numbers]

- 1...Head body
- 1A...Sole
- 2...Hosel part
- 3...Inserting hole
- 4...Shaft
- 10...Lower hole
- 11...Weight



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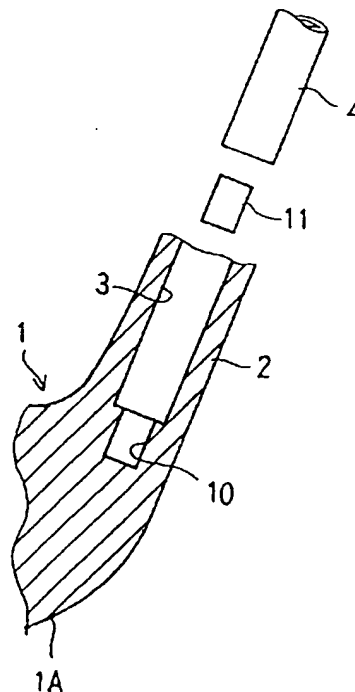
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(54) 【発明の名称】 ゴルフクラブ

(57) 【要約】

【課題】 クラブの性能・品質を低下させることなく誰でも容易にかつ高い精度でスイングバランスを調整することができるようにする。

【解決手段】 ヘッド本体1にホーゼル部2が設けられ、ホーゼル部2の挿入孔3にシャフト4を挿入装着したゴルフクラブにおいて、ホーゼル部2の挿入孔3の實質上延長線上にヘッド本体1のソール1A側に延びる下方孔10を形成し、この下方孔10内にバランス調整用の重り11を設けた。



【特許請求の範囲】

【請求項1】 ヘッド本体にホーゼル部が設けられ、ホーゼル部の挿入孔にシャフトを挿入装着したゴルフクラブにおいて、ホーゼル部の挿入孔の実質上延長線上にヘッド本体のソール側に延びる下方孔を形成し、この下方孔内にバランス調整用の重りを設けたことを特徴とするゴルフクラブ。

【請求項2】 下方孔はソール側に開口して挿入孔と離れた位置に形成されていることを特徴とする請求項1に記載のゴルフクラブ。

【請求項3】 挿入孔と下方孔とが連続していることを特徴とする請求項2に記載のゴルフクラブ。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】この発明は、ゴルフクラブに関し、特にスイングバランスの調整を容易にしたゴルフクラブに関する。

【0002】

【従来の技術】従来のゴルフクラブにおけるスイングバランスの調整は、図7に示すように、ヘッド本体1のホーゼル部2の挿入孔3に接着剤を流し込み、次いでこの挿入孔3にシャフト4を挿入して接着し、シャフト4の先端側の中空部に入り込んだ接着剤が乾く前にシャフト4のグリップ装着側からシャフト4の中空部内へ所定重量の鉛等の重り5を入れて接着剤の中へ沈降させ固定していた。あるいは、上述のようにシャフト4を装着し終えた後、すなわち接着剤が乾いた後にタングステン等の粉体をシャフト4のグリップ装着側から中空中へ入れ、その後に中空部内へコルク栓を押し込んで固定したりしていた。

【0003】

【発明が解決しようとする課題】この方法でバランスを調整する場合、ヘッドとシャフトを接着する接着剤の乾燥状態やコルク栓のつめ具合によって重りの固着が不十分で重りがシャフト内部で動いてしまう等してクラブの性能・品質を低下させてしまうことがある。また、接着剤の乾燥の早さは季節や天候等の環境に影響される所もあるため作業にスピードや勘など熟練度を要する。その他にも重り等の詰め物を管状シャフトの孔のヘッド側先端部分に施すためその量によってはシャフトのヘッドとの接着部つけ根部分よりも上方まで詰め物がきてしまうとシャフトつけ根部分でシャフトが折れやすくなったり、シャフトのしなり方が変わってクラブの性能・品質が低下してしまうことがある。また、シャフトの孔の径もシャフトによって異なることが多く、等量の詰め物をしてシャフトつけ根より上方までくるとそうでないものとの差が出ることもある。このように調整の際、気を付けなければならない点が多く、また不良が発生しやすかった。

【0004】この発明は従来のものがもつ、以上のような課題を解消させ、クラブの性能・品質を低下させることなく誰でも容易にかつ高い精度でスイングバランスを調整することのできるゴルフクラブを提供することを目的とするものである。

【0005】

【課題を解決するための手段】上記目的を達成するため、この発明は、ヘッド本体にホーゼル部が設けられ、ホーゼル部の挿入孔にシャフトを挿入装着したゴルフクラブにおいて、ホーゼル部の挿入孔の実質上延長線上にヘッド本体のソール側に延びる下方孔を形成し、この下方孔内にバランス調整用の重りを設けたものである。

【0006】

【発明の実施の形態】以下に、この発明の好適な実施例を図面を参照にして説明する。

【0007】図1に示す第1実施例では、ヘッド本体1にホーゼル部2が設けられ、ホーゼル部2の挿入孔3にシャフト4を挿入装着するようになっており、ホーゼル部2の挿入孔3の実質上延長線上にヘッド本体1のソール1A側に延びる下方孔10を形成し、この下方孔10内にバランス調整用の重り11を設けるようになっていいる。この実施例では、挿入孔3と下方孔10とは連続し、下方孔10の径を挿入孔3の径よりも若干小さく形成してある。挿入孔3と下方孔10の径は同一径であっても差し支えない。図2は、重り11およびシャフト4を装着した状態を示し、符号12はソケットを示す。挿入孔3および下方孔10には従来と同様に接着剤を流し込んでおき、重り11もシャフト4の先端部も接着剤でそれぞれの孔に接着される。重り11としては、例えば次の4種類を用意する。すなわち、0.5gのプラスチック製重り、1.0gのアルミ合金製の重り、2.0gのステンレス製重り、3.0gの鉛製の重りである。それぞれ同体積、同形状の円柱体で構成し、調整しようとするスイングバランスに応じて選択する。

【0008】図3に示す第2実施例では、下方孔10をソール1A側に開口し、挿入孔3とは離れた位置に形成したものを示す。図4は図3に示すそれぞれの孔にシャフト4および重り11を装着した状態を示すものである。この、第2実施例では、シャフト4を接着剤によりホーゼル2に装着し終えた後、すなわち接着剤乾燥後であっても、スイングバランスの調整ができる。勿論、シャフト4と重り11とを同時的に接着することも可能である。

【0009】図5に示す第3実施例は、挿入孔3と下方孔10とを連続させ、下方孔10はソール1A側に開口したものを示す。図6は、図5の実施例においてシャフト4ならびに重り11を装着した状態を示すものである。下方孔10がソール1A側に開口したものにあっては、ソール1A側の空隙を適当な物質で充填しておくことが、泥等の異物が詰まるのを防止するのに有効であ

る。このことは、図4に示す実施例においても同様である。

【0010】重り11としては、同一材料のもののみを装着するのではなく、異なった材料のものを組合せて装着することもできる。上述した材料の他に重り11としては、銅（比重8.93）、鉄（比重7.64）、亜鉛（比重7.14）、チタニウム（比重4.5）等も使用することができる。また、この重り11は固体に限らずタングステンの粉末等の粉体であっても差し支えない。

【0011】

【発明の効果】以上説明したように、この発明によれば、ホーゼル部の挿入孔の実質上延長線上にヘッド本体のソール側に延びる下方孔を形成し、この下方孔内にバランス調整用の重りを設けたので、シャフトの中空部に重りが位置することがなくなり、シャフトの性能変化も生ぜず、熟練を要せずに容易にスイングバランスの調整を図るための重りを装着することができる。

【図面の簡単な説明】

【図1】第1実施例を示す断面図。

【図2】組立て後の正面図。

【図3】第2実施例を示す断面図。

【図4】組立て後の正面図。

【図5】第3実施例を示す断面図。

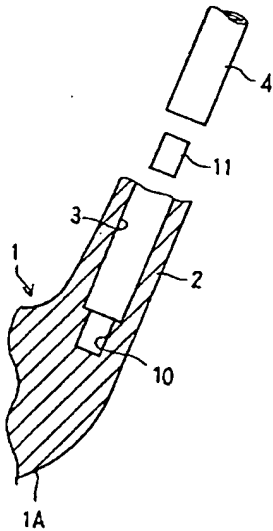
【図6】組立て後の正面図。

【図7】従来例を示す正面図。

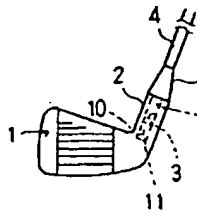
【符号の説明】

- 1 ヘッド本体
- 1A ソール
- 2 ホーゼル部
- 3 挿入孔
- 4 シャフト
- 10 下方孔
- 11 重り

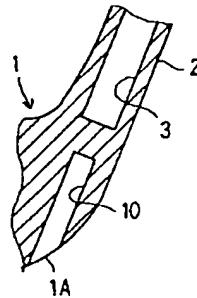
【図1】



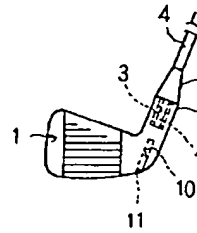
【図2】



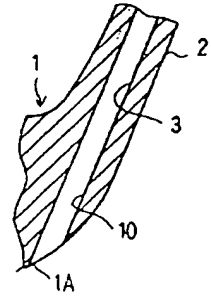
【図3】



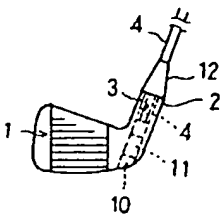
【図4】



【図5】



【図6】



【図7】

